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# SILK

## Its Origin, Culture, and Manufacture

ILLUSTRATED FROM PHOTOGRAPHS TAKEN
AT THE CORTICELLI SILK MILLS, AND
BY COLORED PLATES REPRODUCED
FROM ORIGINAL JAPANESE PHO-
TOGRAPHS ESPECIALLY
COLORED BY
HAND

*Price 50 Cents*

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THE CORTICELLI SILK MILLS

FflorENCE, MASSACHUSETTS

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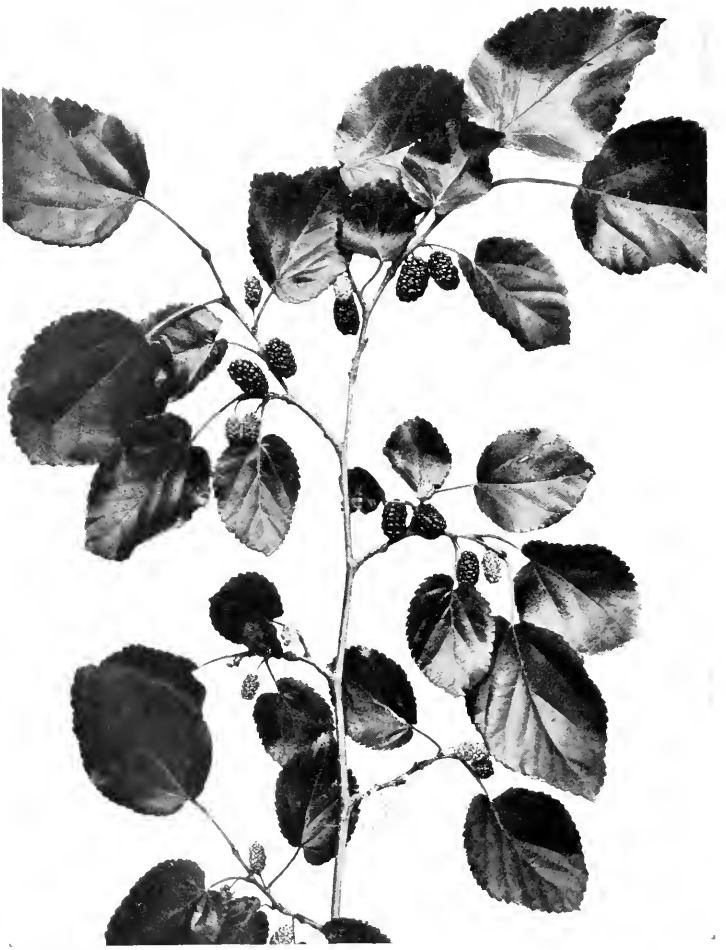


BRANCH OF THE MULBERRY TREE—SHOWING BERRIES.

## *Publishers' Note.*

A growing demand from teachers and others for a reliable and concise book of information on silk culture has prompted the preparation of this little pamphlet.

No more gratifying reception was ever accorded a text-book than has been given this little work on the origin, culture, and manufacture of silk. Since the first edition published in 1895, the sale of the book has been truly remarkable.

It is distinctly an educational work, embracing as it does the most interesting facts gathered from the experience of years of scientific and practical study devoted to the rearing of this wonderful insect. We may be pardoned for thinking that perhaps no other concern is better qualified to undertake the publication of such a work, since for over seventy years the products of the Corticelli Silk Mills have been the recognized standard of the silk thread world.

In presenting this revised and enlarged edition it is our desire to thank the thousands of teachers in the best and largest schools, academies, and colleges throughout the country for their many kind words of appreciation, and to assure them we are always ready to assist in securing the specimens necessary for a proper presentation to their pupils of this most interesting subject. See pages 45 and 46.

The fine half-tone engravings were made from photographs of the Corticelli Silkworms taken from life. We believe them to be the most truthful reproductions of silkworm life in existence. The entire contents of this booklet, including all the photographs, are protected by copyright, and must not be copied or reproduced.

CORTICELLI SILK MILLS.

FEEDING THE YOUNG SILKWORMS AND REMOVING FROM THE EGG PAPERS THE TINY CORTICELLI SILKWORMS JUST HATCHED.

## *The Discovery and Introduction of Silk.*

The history of silk starts with Hoang-Ti, the third Emperor of China, who charged his wife and queen, Si-Ling-Chi, to examine the silkworms and test the practicability of using the thread from the cocoons. In her zeal she collected large numbers of the worms, fed them herself, and discovered how to reel the silk and to make it into garments. This was about 1700 B. C., and for her discovery she was deified, so the Chinese records say, and ever since has been known as the "Goddess of Silkworms."

The wild silkworms or allied species were found in Southern or Eastern Asia, inhabiting the jungles of India, Pegu, Siam, and Cochin China; but the cocoons were used only for carding and spinning, very much as spun silk is now produced. Meanwhile the Chinese kept their method of obtaining the silk a profound secret for nearly two thousand years. They gave the silk to the Persians, who for one thousand years, without knowing how or from what it was made, carried it to the Western Nations.

Aristotle was the first European to learn the true origin of the wrought silk brought to him from Persia on the return from that country of Alexander's victorious army. He described the silkworm as a "horned insect, passing through several transformations, which produced 'bombykia,'" as he called the silk. However, for five hundred years after this time the common theory of the origin of silk, among the Greeks and Romans, was quite different, since they had confounded the production of silk with that of cotton.

In Aristotle's time Pamphile and her associates in the Island of Cos (the modern Zea in the Ægean Sea) had imported raw silk from Persia, and unraveling it had woven a silken gauze, which from its transparency was called "woven wind." Soon the Roman ladies followed

her example, substituting for silk fine threads of linen or cotton for the weft or filling, and before long it became in great demand. The Roman emperors arrayed themselves in costly silken garments, and soon laws were passed restricting its use to the nobility and to women. The Emperor Aurelian is said to have refused his empress a silken robe on the ground of its great costliness.

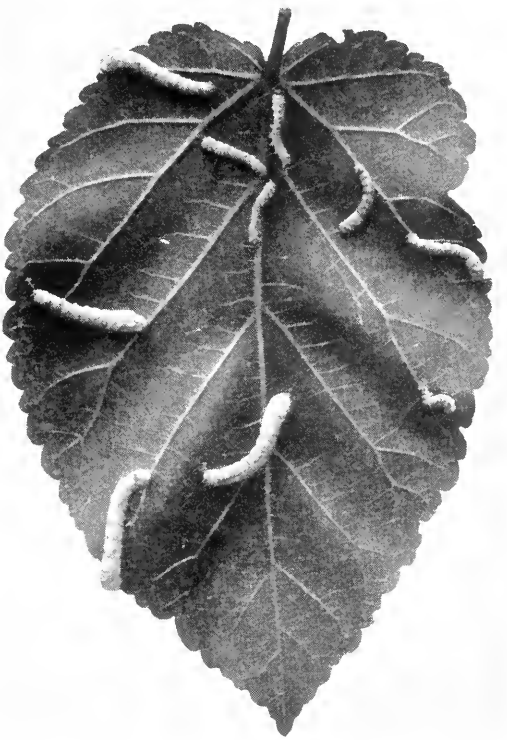
In the sixth century A. D., all the raw silk was still being imported from China, by way of Persia, when the Emperor Justinian, having engaged in war with Persia, found his supply of raw silk cut off and the manufacturers in great distress. No one, on pain of death, was allowed to export the silkworm eggs from China, but Justinian bribed two Nestorian monks to return to that country, and in 555 they came back bringing with them a quantity of silkworm eggs concealed in the hollow of their pilgrims' staves. The industry now spread rapidly over Greece and Syria, into Spain in 711, into Sicily and Naples in the twelfth century, reaching Italy in the sixteenth and France in the seventeenth century.

For centuries the finest and richest silks were woven only for the church, the nobility, and the most wealthy knights; Persia, China, and the countries to the far East producing magnificent hand embroidered specimens, the results of years of patient labor.

Silk culture in America started in 1622, when James I. sent silkworm eggs, mulberry trees, and printed instructions to Virginia, but the attempt was not successful. In 1735 eight pounds of silk were exported from Georgia, and seven hundred pounds in 1758, and over ten thousand pounds (seventy-five thousand dollars' worth) in 1759.

Connecticut began to rear silkworms in 1760, and for eighty-four years this state led all others in the amount of silk produced. Soon after 1769 Pennsylvania, New Jersey, New York, Rhode Island, and Massachusetts became interested in the industry, but during the Revolution it was given up, and was not revived until 1826, when a most determined effort was made to place silk growing on a

paying basis. For ten years all went well; several states offered premiums and bounties, silk societies were formed, and new machinery was invented and put into operation. But soon a disturbing element was introduced; a great effort was made to supplant the white mulberry (*Morus alba*), on the leaves of which the worms had been fed, by the so-called Chinese mulberry, the *Morus multicaulis*, on account of the superior qualities claimed for it. A sudden infatuation seized the people, speculation began, and prices advanced far beyond their real value.

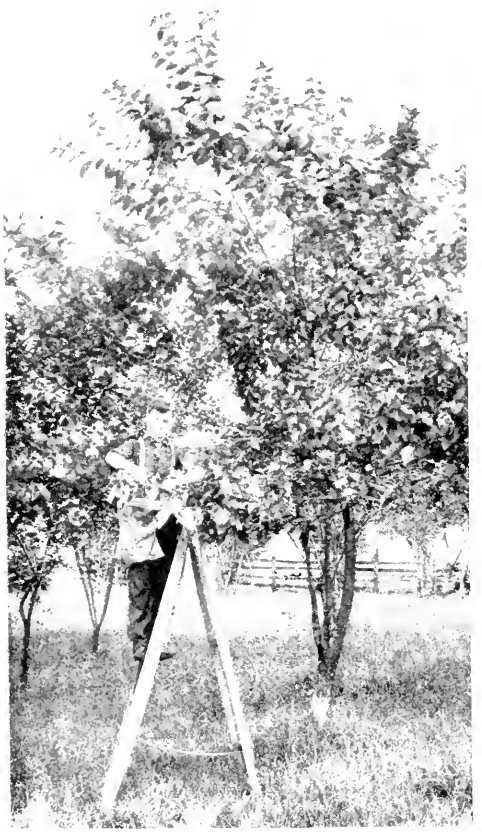


CORTICELLI SILKWORMS—SIX AND TEN DAYS OLD.

Since 1830 Florence, Mass., had been identified with the silk culture movement, and the whole surrounding country soon caught the fever, and as the excitement increased acres of mulberry cuttings and trees were planted. Then in 1839 came the crash. The bubble had burst, bringing ruin to thousands of persons, and mulberry twigs which had been worth nearly their weight in gold could not be

sold for ten cents a hundred. A severe winter killed most of the trees, giving the industry a final blow.

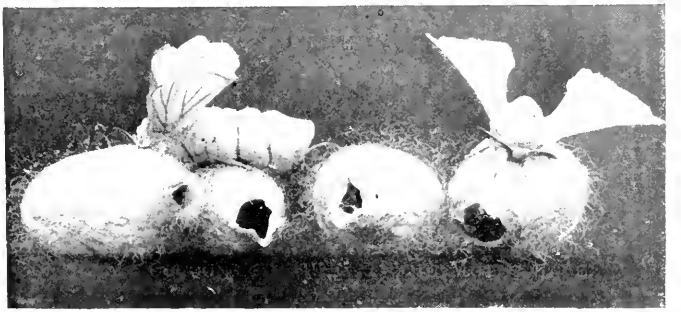
The company at Florence gave up silk growing for a few years, but the manufacture of Corticelli Silk, started in 1838, was continued, and from that day to this the products of the famous Corticelli Silk Mills have always enjoyed an enviable but well earned reputation for superiority.



GATHERING MULBERRY LEAVES.

It is a fact not generally appreciated that silk is the strongest fiber known to science as well as the only fiber which is proof against decay caused by dampness. Cotton will soon mildew and rot away, while silk is in its element when wet, and may even be soaked in water without impairing its strength. In these days of keen competition many imitations of silk are sold under various fancy and deceptive names, but no substitute invented by man can replace the wonderful work of nature and the Corticelli Silkworm.

more slender, and finally unite within the spinneret, a small double orifice below the mouth, from which the silk issues in a glutinous state and apparently in a single thread.

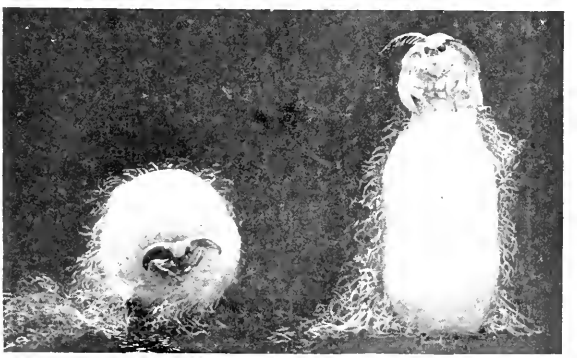


CORTICELLI COCOONS FROM WHICH THE MOTHS HAVE EMERGED.

The gummy liquid which combines the two strands hardens immediately on exposure to the air.

The worm works incessantly, forcing the silk out by the contraction of its body. The thin, gauze-like network which soon surrounds it gradually thickens, until, twenty-four hours after beginning to spin, the worm is nearly hidden from view. However, the cocoon is not completed for about three days.

The cocoon is tough, strong, and compact, composed of a firm, continuous thread, which is, however, not wound in concentric circles, but irregularly in short figure eight loops, first in one place and then in another. The motion of the worm's head when



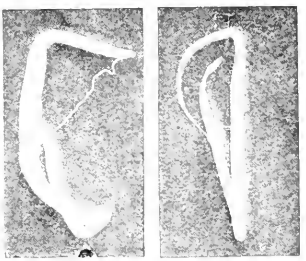
MOTHS EMERGING FROM CORTICELLI COCOONS.

SIDE VIEW OF CHRYSALIS.

BOTTOM VIEW OF CHRYSALIS.

starting the cocoon is very rapid, and nine to twelve inches of silk flow from the spinneret in a minute, but later the average would be about half this amount per minute.

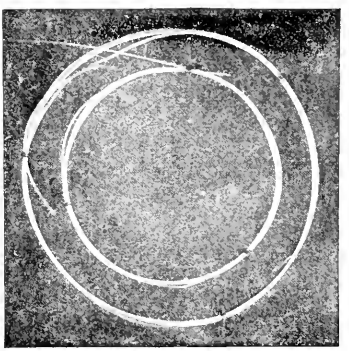
The silk secretion, on account of its transparency, is sometimes used for snells, the tough, sinew-like cords by which fishhooks are attached to longer lines, and in foreign countries large numbers of worms are annually used for this purpose. When the worm is ready to spin, after being steeped in strong chemicals, the silk glands are taken from its body, and are dexterously drawn out to the desired length. One gland is usually sufficient for two and sometimes for three fishhooks.



TWO SILK GLANDS TAKEN FROM ONE CORTICELLI SILKWORM.

The color of the worm's prolegs before spinning indicates the color the cocoon will be. This varies in different species, and may be a silvery white, cream, yellow, lemon, or green.

When the worm has finished spinning, it is one and a quarter inches long. Two days later, by a final molt, its dried-up skin breaks at the nose and is crowded back off the body, revealing the chrysalis, an oval cone one inch in length. It is a light yellow in color, and immediately after molting is soft to the touch. The ten prolegs of the worm have disappeared, the four wings of the future moth are folded over the breast, together with the six legs and two feelers,



CORTICELLI SILK SNELLS.

or antennæ. It soon turns brown, and the skin hardens into a tough shell. Nature provides the cocoon to protect the worm from the elements while it is being transformed into a chrysalis, and thence into the moth.

Male Corticelli Moth.

Female Corticelli Moth.

With no jaws, and confined within the narrow space of the cocoon, the moth has some difficulty in escaping. After two or three weeks the shell of the chrysalis bursts, and the moth ejects against the end of the cocoon a strongly alkaline liquid which moistens and dissolves the hard, gummy lining. Pushing aside some of the silken threads and breaking others, with crimped and damp wings the moth emerges ; and the exit once effected, the wings soon expand and dry.

The escape of the moth, however, breaks so many threads that the cocoons are ruined for reeling, and consequently, when ten days old, all those not intended for seed are placed in a steam heater to stifle the chrysalis, and the silk may then be reeled at any future time.

Eggs of the Silkworm Moth.

The moths are cream white in color. They have no mouths, but do have eyes, which is just the reverse of the case of the worm. From the time it begins to spin until the moth dies, the insect takes no nourishment. The six forward legs of the worm become the legs of the moth. Soon after mating the eggs are laid.

The male has broader feel-

WEIGHING AND SORTING CORTICELLI COCOONS.

ers than the female, is smaller in size, and quite active. The female lays half her eggs, rests a few hours, and then lays the remainder. Her two or three days' life is spent within a space occupying less than six inches in diameter.

One moth lays from three to four hundred eggs, depositing them over an even surface. In some species a gummy liquid sticks the eggs to the object upon which they are laid. In the large cocoon varieties there are full thirty thousand eggs in a single ounce avoirdupois. It takes from twenty-five hundred to three thousand cocoons

A Bale of Raw Silk and the "Books" it Contains.

to make a pound of reeled silk. Do you wonder that, centuries ago, silk was valued at its weight in gold ?

Growers of silk in the United States, by working early and late every day during the season, which lasts from six to eight weeks, could scarcely average fifteen cents for a day's labor of ten hours. Silk, once regarded as a luxury, is now considered a necessity, and no one concern has done more to make this possible than the Corticelli Silk Mills. In fact, Corticelli Silk holds the world's record for superiority, having won 40 Highest Awards at Expositions held in the United States and abroad.

SKEINS OR "HANKS" OF CORTICELLI RAW SILK, FIRST SORTED AS TO COLOR, THEN TIED AND PRESSED INTO SQUARE BUNDLES CALLED "BOOKS."

## *Reeling the Silk from the Cocoons.*

Reeling the silk from the cocoons is not often done in the United States, as most of the raw material which is imported comes reeled all ready for the manufacturer.

The cocoons are first assorted, those of the same color being placed by themselves, and those of fine and coarse texture likewise. The outside loose silk is then removed, as this cannot be reeled, after which the cocoons are plunged into warm water to soften the "gum" which sticks the threads together. The operator brushes the cocoons with a small broom, to the straws of which their fibers become attached, and then carefully unwinds the loose silk until each cocoon shows but one thread. These three operations are called "soaking," "brushing," and "cleansing."

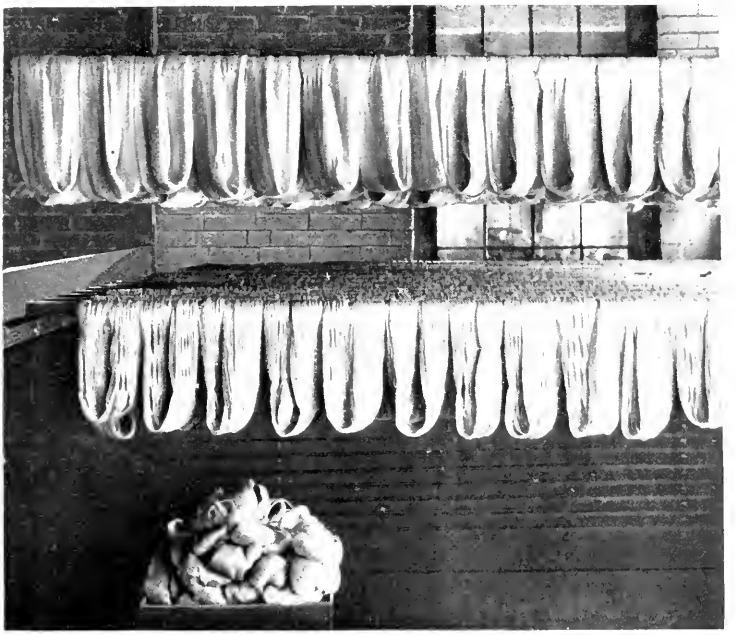
Into one or two compartments in a basin of warm water below the reel are placed four or more cocoons, according to the size of the thread desired. The threads from the cocoons in each compartment are gathered together and, after passing through two separate perforated agates a few inches above the surface of the water, are brought together and twisted around each other several times, then separated and passed upward over the traverse guide-eyes to the reel. See Colored Plate "Reeling the Silk from Corticelli Cocoons" by foot power. The traverse moves to and fro horizontally, distributing the thread in a broad band over the surface of the reel. The rapid crossing of the thread from side to side of the skein in reeling facilitates handling and unwinding without tangling, the natural gum of the silk sticking the threads to each other on the arms of the reel, thus securing the traverse. Silk reeled by hand or foot power is known as "Re-reel" silk, while silk reeled by power machinery is called "Filature."

The fiber of the cocoon is somewhat finer at the beginning, thickens at the point of forming the more compact

Reeling the Silk from Corticelli Cocoons by Foot Power, Called "Re-reel" Silk.

part, and then very gradually diminishes in diameter until it becomes so fine as to be incapable of standing the strain of reeling. This is because the silk from one of the worm's two glands is exhausted, leaving but one half the original fiber.

When one of the threads breaks or the end of one cocoon is reached, the reeler takes a fresh one, and with thumb



Drying Corticelli Raw Silk after Soaking it in Water to Soften the Natural Gum.

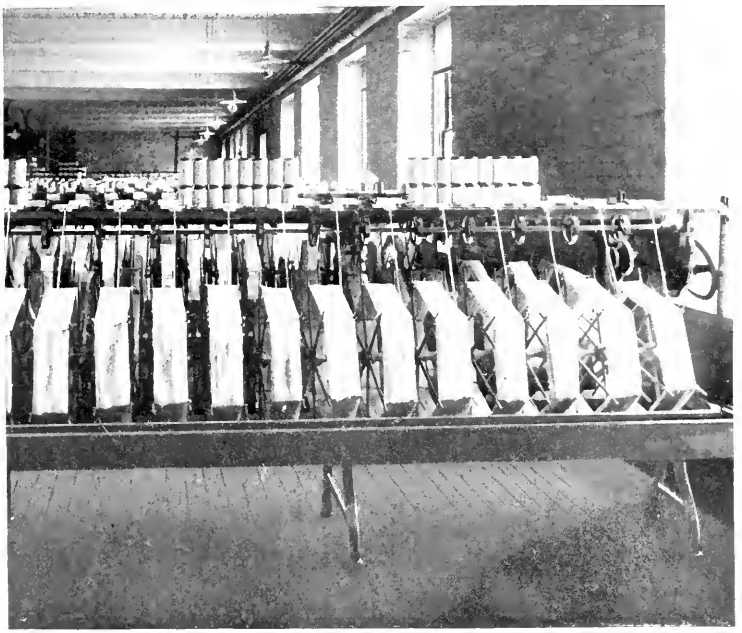
and forefinger as shown by the Colored Plate dexterously twists its end around the running thread, of which from that moment it becomes a constituent part.

Imported raw silk comes in skeins of from one to several ounces, packed into bundles called "books," weighing from five to ten pounds. In China and Japan the books are usually sold in bales varying from one hundred to one hundred and sixty pounds.

A Filature- Reeling the Silk from Corticelli Cocoons by Power Machinery.

## *How Silk is Manufactured.*

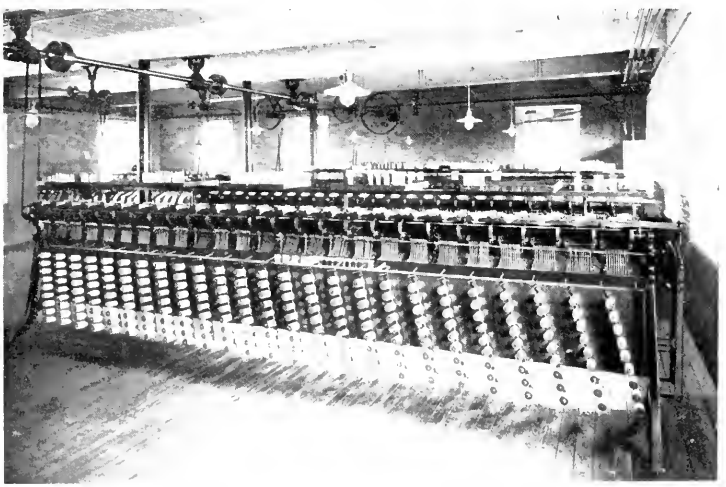
The Corticelli raw silk is first assorted, according to the size of the fiber, as fine, medium, and coarse. The skeins are put into canvas bags and then soaked over night in warm soapsuds. This is necessary to soften the natural gum in the silk, which had stuck the threads together on



WINDING CORTICELLI RAW SILK.

the arms of the reel. Following the soaking, the skeins are straightened out and hung across poles in a steam-heated room, as shown in the accompanying photograph. When the skeins are dry, they are ready for the first process of manufacturing. The room we now step into is filled with "winding frames," each containing two long

rows of "swifts," from which the silk is wound on to bobbins. The bobbins are large spools about three inches long. The bobbins filled with silk, as wound from the skeins, are next placed on pins of the "doubling frames"; the thread from several bobbins, according to the size of the silk desired, is passed upward through drop wires on to another bobbin. Should one of the threads break, the



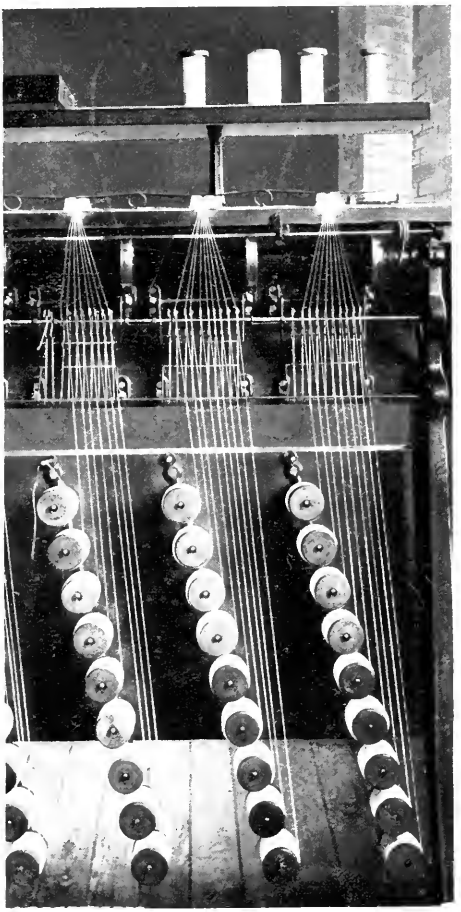
COMBINING SEVERAL SINGLE STRANDS OF RAW SILK PREPARATORY TO SPINNING. THIS PROCESS IS CALLED "DOUBLING."

"drop wire" falls, which action stops the bobbin. By this ingenious device absolute uniformity in the size of Corticelli silk is secured. The "doubling frame" is shown in one of the photographs, and another photograph shows an enlarged view of this frame, giving an idea of the four sections, on each of which are running nine bobbins.

The bobbins taken from the "doubling frame" are next placed on a "spinner." Driven by an endless belt, at the rate of over six thousand turns a minute, the bobbins revolve, the silk from them being drawn upward on to another bobbin. This spins the several strands brought together by the "doubling process" into one thread, the

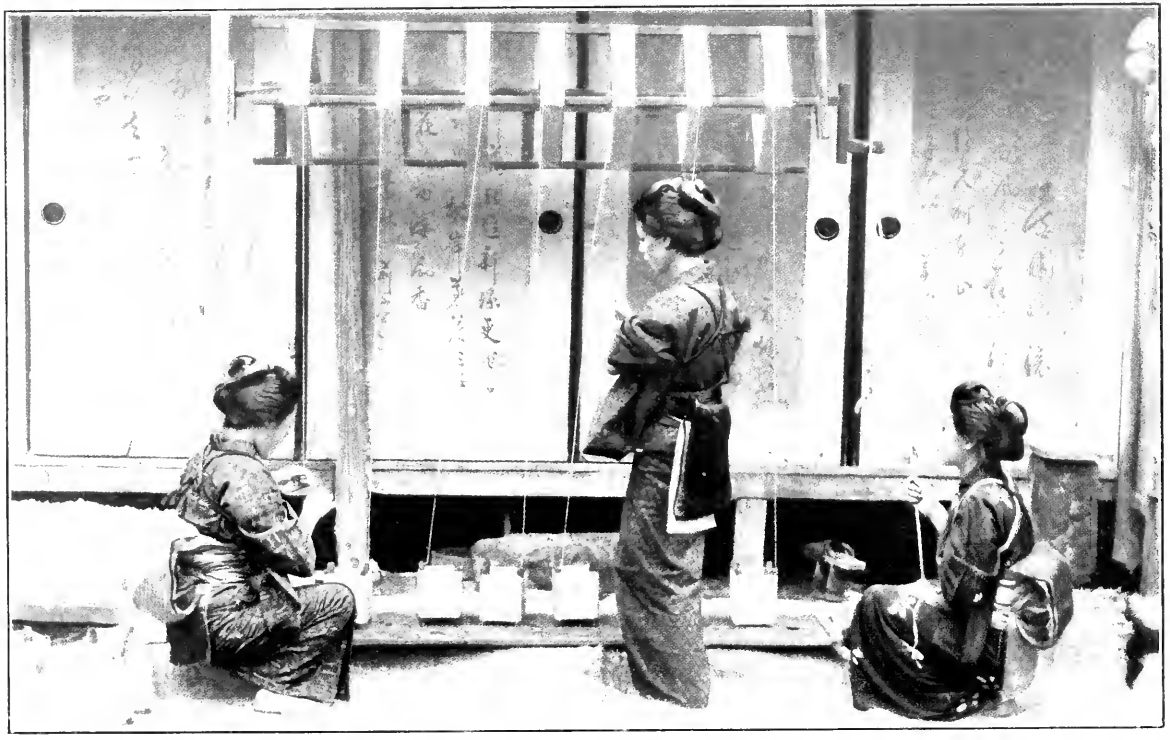
number of turns depending on the kind of Corticelli silk—Filo silk being spun quite slack, and Machine Twist just the reverse.

A transferring machine combines two or three of these strands; two for sewing silk and three for machine twist; and the bobbin next goes on to the "twisting machine"—a machine that is similar to a "spinner," but the silk is twisted in the opposite direction from the spinning. To stand before these machines and watch how rapidly and how accurately they do the work assigned them is a revelation. No one realizes how nicely the parts are adjusted. If but one tiny strand breaks that part of the machinery is stopped by an automatic device which works instantaneously and the operator then repairs the broken fiber. As a result only perfect silk can be made. You see, Corticelli is simply another name for perfection.

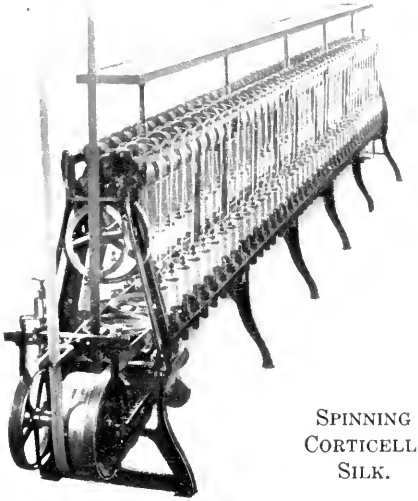


ENLARGED VIEW OF "DOUBLING" FRAME SHOWING DROP WIRE DEVICE THAT INSURES THE PERFECTLY EVEN SIZE OF ALL CORTICELLI SILK.

After twisting, the silk is stretched by an ingenious

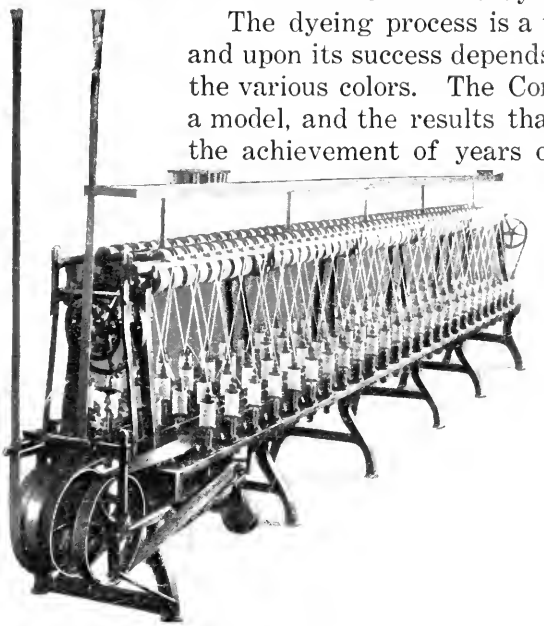


REWINDING "RE-REEL" CORTICELLI SILK, AFTER IT IS DRY, INTO LARGE SKEINS.



SPINNING CORTICELLI SILK.

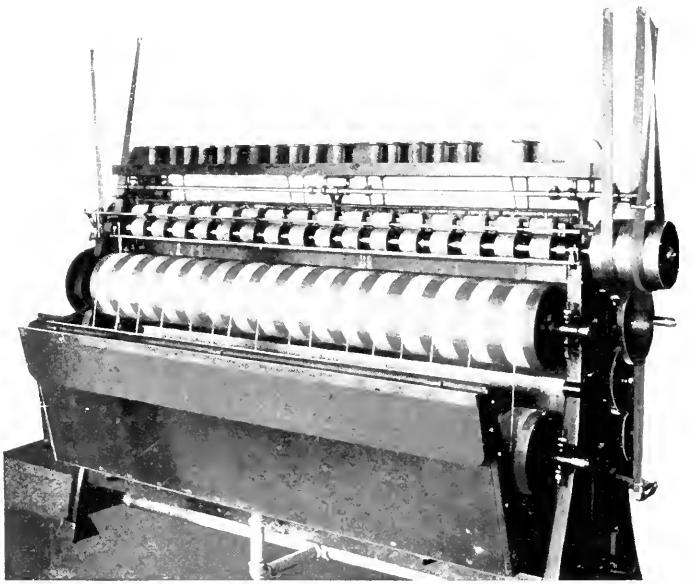
machine called a "water-stretcher." This smoothes and consolidates the constituent fibers, giving an evenness to Corticelli silk not to be obtained by any other known process. The bobbins are placed in water and the silk wound on to the lower of the two copper rolls. From the lower roll it passes upward to the upper roll, which turns faster than the lower one, thereby stretching the silk. From the upper roll it passes again on to a bobbin, only to be again reeled off into hanks when it is ready for the dye house.



TWISTING CORTICELLI SILK.

The dyeing process is a very important one, and upon its success depends the permanency of the various colors. The Corticelli dye house is a model, and the results that come from it are the achievement of years of scientific investigation and experimenting. Vast tubs, tanks, and kettles surround you on every side, and the hissing steam seems to spring from all quarters. The "gum" of the silk is first boiled out by immersion in strong soapsuds for about four hours. The at-

tendants, standing in heavy "clogs" (big shoes with wooden soles two inches thick), turn the silk on the sticks at intervals until the gum is removed. After the silk is dyed it is put into a "steam finisher," a device looking like a long, narrow box with a cover opening on the side, set upright on top of an iron cylinder. The hanks of silk are placed upon two pins in the steam chest, the cover fastened, and the live steam rushes in around the silk.

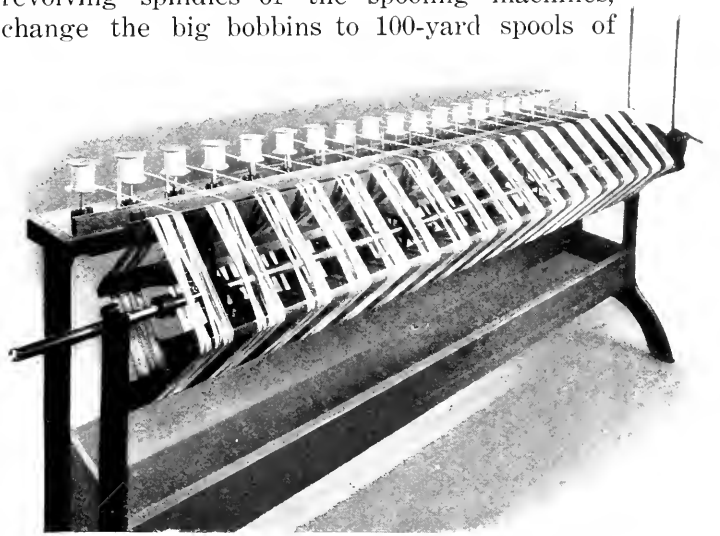


CORTICELLI WATER STRETCHER.

This brightens the silk, giving it the lustrous, glossy appearance noticeable in all Corticelli goods. The silk comes from this machine quite stiff, and the hanks are next placed on the "stringer," which twists the hank first in one direction and then in the other, as one would ring out water. There is no water in the silk, however, but this action makes the silk smooth and soft. Many of the machines used by this company are of their own invention, patented and controlled by them, which, together with the experience of over seventy-three years in silk

manufacturing, enables them to produce silk goods of unequaled quality and of exceptional luster and brilliancy.

From the large skeins the silk is again wound on to bobbins, and then spooled, balled, coned, braided, or skeined, according to the kind of silk and the use for which it is intended. Rows of girls, seated at the rapidly revolving spindles of the spooling machines, change the big bobbins to 100-yard spools of



REELING CORTICELLI SILK INTO SKEINS TO SEND TO THE DYE HOUSE.

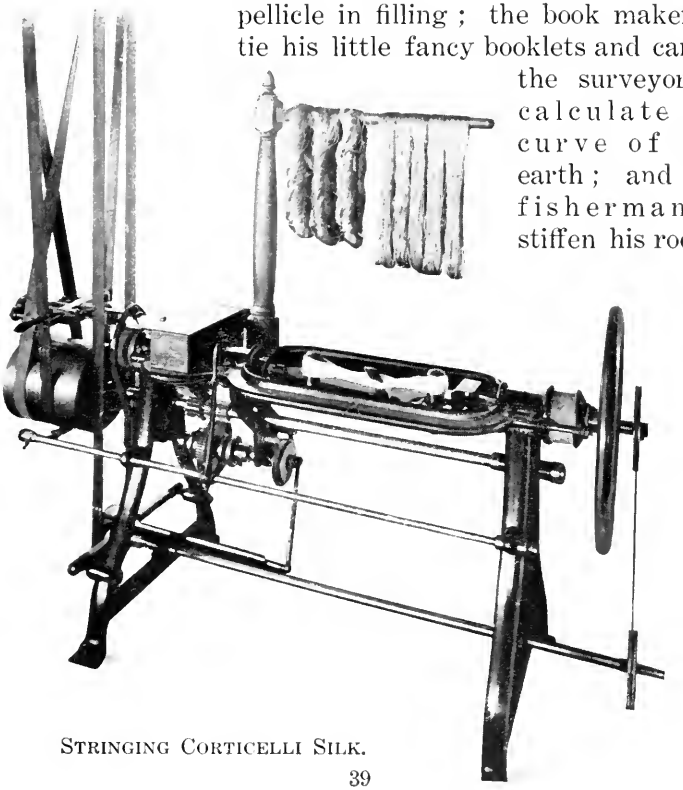
Corticelli Spool Silk. The accompanying illustration shows a young lady spooling ounce spools of white Corticelli Machine Twist. The balling machine is equally interesting, as one watches sixteen empty wooden spools transformed as if by magic, in less than three minutes, into sixteen symmetrical balls of Corticelli Crochet Silk.

Then come the labeling and the boxing, and the goods are taken to the stock room, where huge shelves, arranged in tiers, are filled high with silk of every description, from the very finest OOO to the coarsest size, and from the tiny spools of Corticelli Buttonhole Twist to the big ounce spools of Corticelli Machine Twist. From the stock

A Filature Rewinding Corticelli Silk from the Small Reels into Large Skeins.

room are shipped each day, to the eight wholesale city salesrooms of this company, case after case, packed snugly with neat boxes all filled with spools or skeins of silk, which find their way into the stores of nearly every merchant in the land.

The various uses made of silk are truly wonderful. Some of the ones not generally known are here given. The electrician uses it for insulating wires for the incandescent lamps, for filaments within the same, carbonizing it for this purpose; the surgeon to tie arteries and sew together cuts in the flesh, and to cover silk cloth with gum-tragacanth for adhesive and non-poisonous plasters for wounds and abrasions; the dentist to clean between the teeth and tie the pellicle in filling; the book maker to tie his little fancy booklets and cards; the surveyor to calculate the curve of the earth; and the fisherman to stiffen his rod by

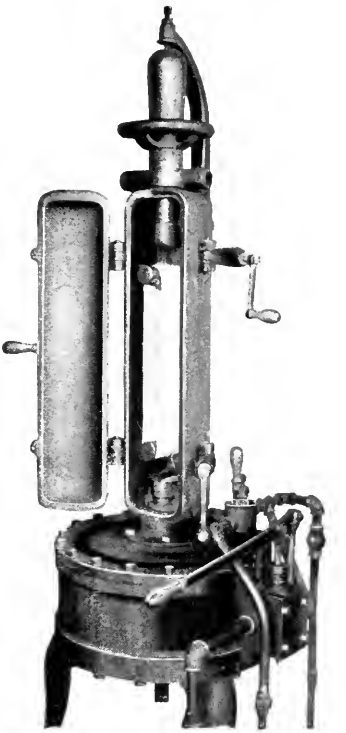


STRINGING CORTICELLI SILK.

A View in the Dye House of the Corticelli Silk Mills.

winding or to snell the hook with which he deceives the wary fish.

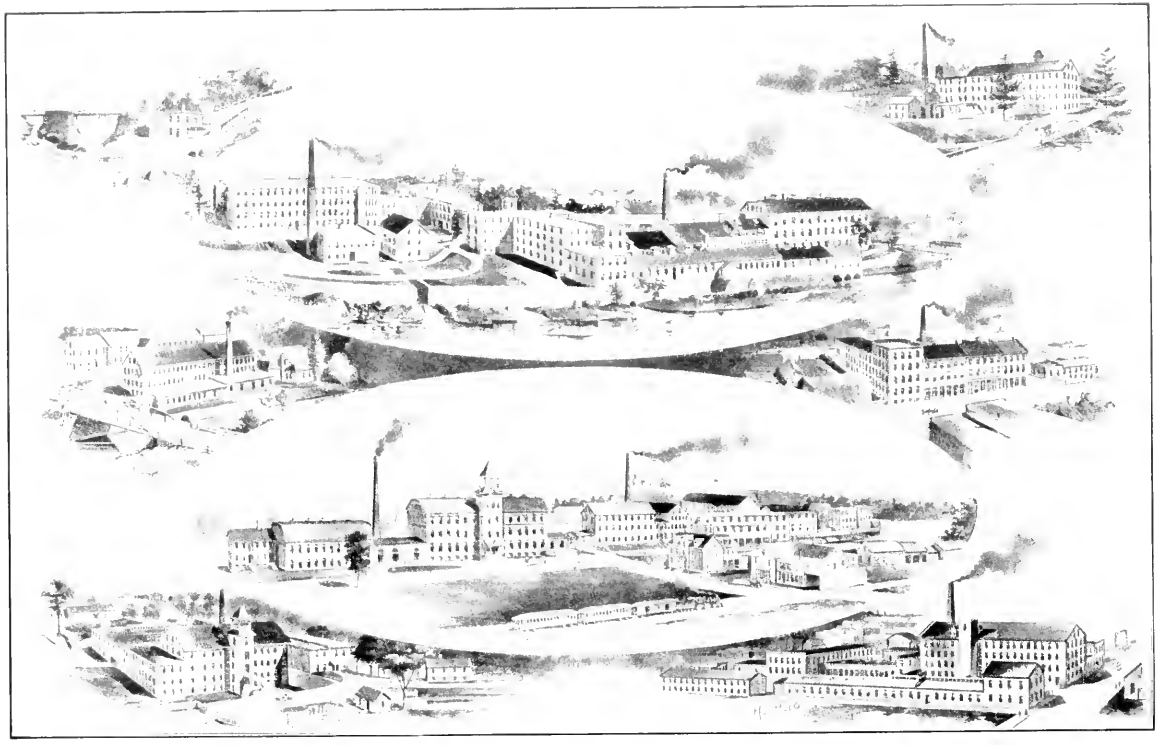
The variety of goods made at the Corticelli Silk Mills is a surprise to almost every one. Corticelli spool silk is of course a familiar object in every household, as few indeed are the workbaskets that do not contain one or more of these 100-yard spools. Besides this, there is Corticelli machine twist, sewing silk, crochet silk, knitting silk, lace silk, filo silk, Persian floss, Roman floss, rope silk, etching silk, twisted embroidery silk, buttonhole twist, dental floss, surgeons' silk, darning silk, and purse twist.



Steam Finisher.

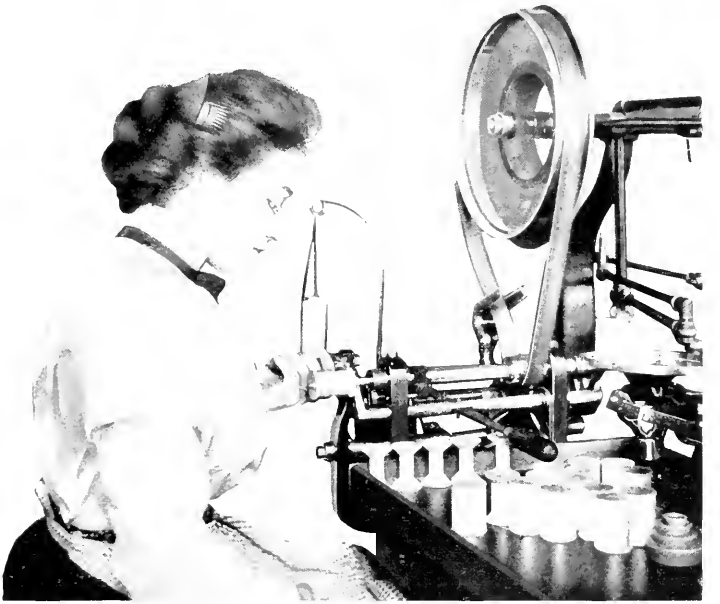
Perhaps one of the most enormous uses to which the product of the Corticelli Mills is put, is that of embroidery and art needlework. It is a truly feminine accomplishment, sometimes even excelling an artist's brush in the exquisite workmanship displayed. Corticelli embroidery silk ranks first in popular favor for this work, not only on account of its smoothness and luster, but for its absolutely fast color. The perfection of the multitudinous colors and almost indefinable gradations of hue enables the embroiderer to shade the petals so as to closely imitate the real bloom of the flowers.

To meet a growing demand from teachers, students, schools, and museums interested in instructing children how silk is made, this company has prepared a "Silk Culture Cabinet." This is a wonderfully interesting case, substantially made and nicely finished, and shows every



THE CORTICELLI SILK MILLS—THE GREATEST SILK THREAD WORKS IN THE WORLD.

step in the culture of this wonderful insect. It contains small bottles, hermetically sealed, with the eggs of the moth, and the silkworms in different stages of development, from a few days old to the full grown worm; also the chrysalis, the moth, cocoons, and specimens of reeled and manufactured silk. These cabinets sell for two and a



Spooling Corticelli Machine Twist.

half dollars apiece, and so great is the demand for them from institutions and schools all over the country, that the company can hardly supply them fast enough. The value of the cabinet is apparent at once to any one interested in education, and many of the largest and best schools in the country have already secured one of them to place in their museums. To accompany the cabinet is a Teachers' Silk Culture Chart, which is intended to hang on the wall of the schoolroom. This sells for twenty cents. See page 47. Together they make it possible for any teacher to give an object lesson of exceeding interest to all children.

The luster of a silk gown is pleasing to the eye, and its fascinating rustle gives warning to the blind of the approach of a lady; but do the ladies thus charmingly attired realize that thousands of lowly silkworms have given up their home tents (cocoons), and necessarily their lives, to supply material for even one such gown? These cocoons, so skillfully constructed by eyeless worms, are the tents in which they go through Nature's wonderful

Teachers' Silk Culture Cabinet.

evolutions, and from which they emerge butterflies or moths—with eyes, but no mouths—to live only a day or two for purposes of reproduction.

The quantity of raw silk used each year by the Corticelli Mills can scarcely be comprehended. Figures almost lose their meaning. Briefly and approximately stated, three thousand cocoons will yield one pound of silk fiber about seven hundred and fifty miles in length; and as one thousand pounds are used daily by the Corticelli Silk Mills in the manufacture of Corticelli silk thread, it follows that the product of three million cocoons is required, yielding an aggregate length of seven hundred and fifty thousand miles of cocoon fiber, to operate the mills one day. About one hundred cocoon fibers are required to make medium thickness sewing silk, hence the daily product of Corticelli Silk Mills is about seven thousand five hundred miles of finished silk thread—enough to girdle the world in three and one-third days.

## *Teachers' Silk Culture Cabinet.*

The engraving on opposite page gives an accurate idea of the Corticelli Silk Culture Cabinet originated and introduced by us. It is made of cherry, handsomely finished and varnished, with glass top sealed to prevent dust getting inside. The cabinet measures 5 × 12 inches and contains the following handsomely mounted specimens :—

1 Eggs of the Silkworm Moth. (*Sericaria mori.*)
2 Silkworm 10 days old. Preserved in Alcohol.
3 Silkworm 20 days old. Preserved in Alcohol.
4 Silkworm 30 days old. Preserved in Alcohol.
5 Chrysalis. Preserved in Alcohol.
6 Cocoon, pierced by escaping moth.
7 Moth, mounted by latest improved process.
8 Cocoon as spun by Silkworm.
9 Cocoon, floss removed, ready for reeling.
10 Skein of Raw Silk ready to manufacture.
11 Spool of Corticelli Spool Silk, size A.

The cabinet is of convenient size to be examined by members of the class, and by its use each step in the culture of silk can be easily explained. Suffice it to say that we have sold hundreds of these cabinets to many of the best schools, academies, and colleges of this country and in every case they have given entire satisfaction.

☞ CAUTION : Several imitations of this cabinet, which contain cheap specimens of no scientific value, are offered for sale by unscrupulous dealers. Remember we are the originators and are the only firm making the genuine "Teachers' Silk Culture Cabinet." We will consider it a favor if our friends will report to us the names of any agent or dealer offering for sale one of our Teachers' Cabinets under a different name. Such infringements will be prosecuted promptly.

The price of the Cabinet is $2.50, express charges to be paid by the purchaser.

CORTICELLI SILK MILLS, FLORENCE, MASS.

## *Box of Two Corticelli Cocoons.*

For those who want samples in addition to the Teachers' Silk Culture Cabinet and Silk Culture Chart we furnish two cocoons spun by genuine Corticelli Silkworms, packed in a neat little box. These boxes make very attractive

souvenirs and many scholars are only too glad to buy these to take home. Teachers will please notice that we make a special offer on orders for large lots. Each box contains two cocoons. Price, by mail, postpaid, 1 box, 5 cents ; 10 boxes, 40 cents ; 25 boxes, 75 cents.

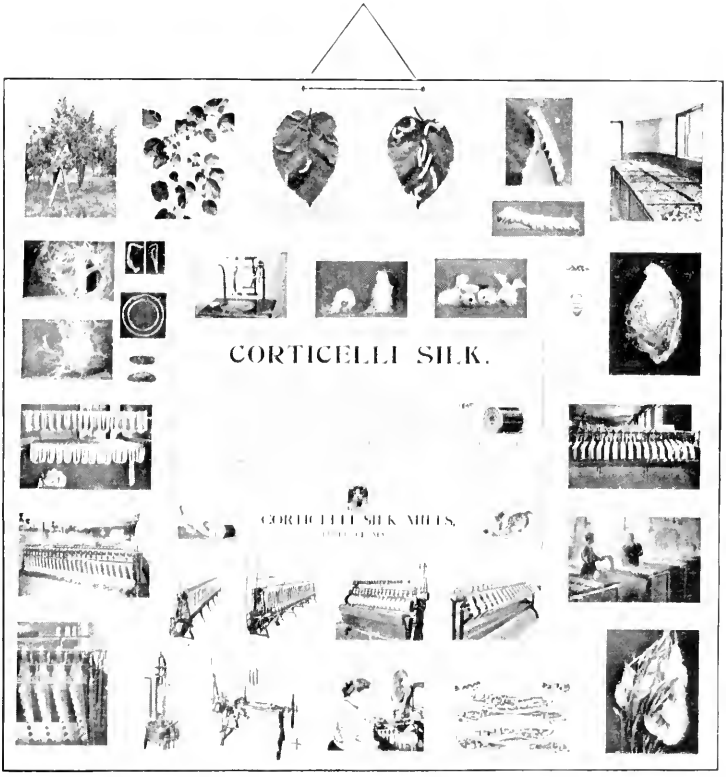
We invite correspondence with teachers desiring specimens for schoolroom use. All questions will be cheerfully answered if a 2-cent stamp is inclosed for reply. We are anxious to help every school to obtain what it needs.

CORTICELLI SILK MILLS, FLORENCE, MASS.

MOTHS LAYING EGGS ON REGULATION PAPERS, WHICH ARE AFTERWARDS INSPECTED BY THE JAPANESE GOVERNMENT, WHEN ALL EGGS THAT MAY BE UNHEALTHY ARE DESTROYED.

## *Teachers' Silk Culture Chart.*

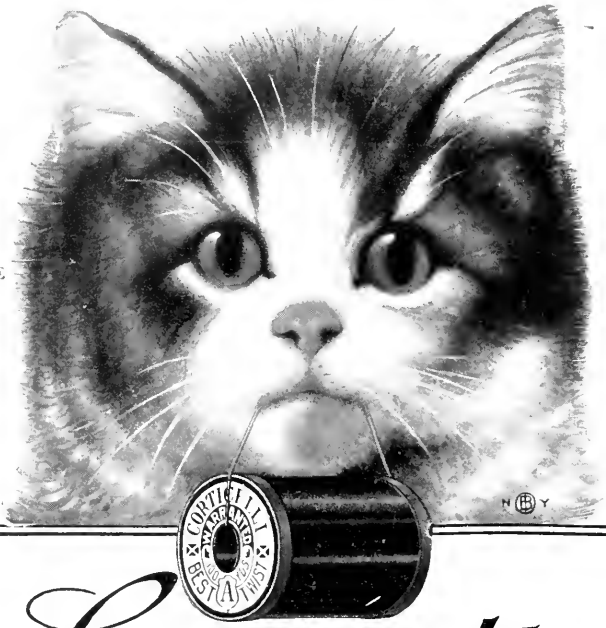
This chart has over thirty engravings showing the different steps in the culture and manufacture of silk. Printed on heavy coated cardboard with reinforced top




and bottom and cord for hanging to schoolroom wall. Price, 20 cents, carefully packed in pasteboard tube for mailing, or will be sent by express, charges to be paid by purchaser, for 12 cents. Address

CORTICELLI SILK MILLS, FLORENCE, MASS.

TRADE MARK




# Corticelli
## SPOOL SILK

Many attempts have been made to find a substitute for silk, especially for sewing purposes. Cotton thread, in imitation of silk, is sold under various names, but vegetable fiber becomes worthless if mildew from dampness gets in its work, whereas silk is in its element when wet, as the following incident proves: In 1874 a silk mill was totally destroyed by the breaking of the reservoir dam, and sewing silk was scattered for miles below, and has been plowed up by farmers frequently since and found to have its original strength. A tangled mass, weighing several pounds, was found in 1901, having been twenty-seven years in the mud at the bottom of the mill pond. After washing and drying, the color (black) was good, its luster fair, and its strength *unimpaired*. Manufacturers, tailors, dressmakers, and women everywhere should profit by this hint. In fact it is "penny wise and pound foolish" to use poor material in a needle for any purpose, and the growing popularity of Corticelli Silk indicates increasing wisdom of the people on this subject. Use silk, not cotton, for all your sewing.

**CORTICELLI SILK MILLS**

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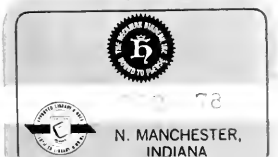
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